UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2003/00747

August 29, 2003

Jason Karnezis
Environmental Specialist
Department of Energy
Bonneville Power Administration
P.O. Box 362
Portland, OR 97208-3621

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Little Walla Walla River Rubber Dam Replacement Project, Little Walla Walla River, Walla Walla River Basin, Umatilla County, Oregon (KEC-4) (1)

Dear Mr. Karnezis:

Enclosed is a biological opinion (Opinion) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) on the effects of Bonneville Power Administration funding the proposed Little Walla Walla River Rubber Dam Replacement Project, Little Walla Walla River, Walla Walla River Basin (WWRB), Umatilla County, Oregon (KEC-4) (1). In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of ESA-listed Middle Columbia River (MCR) steelhead (*Oncorhynchus mykiss*). As required by section 7 of the ESA, NOAA Fisheries includes reasonable and prudent measures with nondiscretionary terms and conditions that are necessary to minimize the impact of incidental take associated with this action.

Any withdrawal of flows that would impair habitat conditions in the Walla Walla River is a habitat-modifying activity that may harm listed species and therefore may be considered "take" under the ESA.[1] However, because instream flows would continue to be withdrawn from the existing facility whether or not the new rubber dam is constructed, NOAA Fisheries does not consider any take associated with such a withdrawal as incidental to the proposed action.

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[1] See, 64 FR 60727 (November 8, 1999) (defining 'harm' as an element of 'take' in the ESA, citing removing water or otherwise altering streamflow when it significantly impairs spawning, migration, feeding or other essential behavioral patterns as an example), and 65 FR 42522 (July 10, 2000) (applying take prohibition to threatened species).

Therefore, compliance with these terms and conditions will not remove the prohibition against take due to any instream flows withdrawn from the new rubber dam. NOAA Fisheries encourages the BPA to seek opportunities to implement the *Basinwide Salmon Recovery Strategy*, published by the Federal Caucus in 2000, by conserving flows in occupied MCR steelhead habitat in the Walla Walla River basin.

This document contains a consultation on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and its implementing regulations (50 CFR Part 600). NOAA Fisheries concludes that the proposed action would adversely affect designated EFH for chinook *(O. tshawytcha)* and coho (*O. kisutch*) salmon. As required by section 305(b)(4)(A) of the MSA, included are conservation recommendations that NOAA Fisheries believes will avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from the proposed action. As described in the enclosed consultation, section 305(b)(4)(B) of the MSA requires that a Federal action agency must provide a detailed response in writing within 30 days of receiving an EFH conservation recommendation.

If you have any questions regarding this letter, please contact Catherine Broyles of my staff in the La Grande Field Office at 541.975.1835 ext. 223.

Sincerely,

for Michael R Crouse

D. Robert Lohn
Regional Administrator

cc: Preston Bronson, CTUIR
Bill Duke, ODFW
Michelle Evans, USFWS
John Kinney, USFWS

Endangered Species Act - Section 7 Consultation
Biological Opinion

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Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Little Walla Walla Rubber Dam Replacement Project
Little Walla Walla River, Walla Walla River Basin
Umatilla County, Oregon (KEC-4) (1)

Agency:	Bonneville Power Administration
Consultation Conducted By:	NOAA's National Marine Fisheries Service, Northwest Region
Date Issued:	August 29, 2003
Issued by:	for Michael R Crouse D. Robert Lohn Regional Administrator
Refer to:	**2003/00747**

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1. INTRODUCTION

The Endangered Species Act (ESA) of 1973 (16 USC 1531-1544), as amended, establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with NOAA's National Marine Fisheries Service (NOAA Fisheries) and U.S. Fish and Wildlife Service (together "Services"), as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their designated critical habitats. This biological opinion (Opinion) is the product of an interagency consultation pursuant to section 7(a)(2) of the ESA and implementing regulations 50 CFR 402.

The analysis also fulfills the essential fish habitat (EFH) requirements under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2)).

The Bonneville Power Administration (BPA) proposes to fund the Little Walla Walla River Rubber Dam Replacement Project. The purpose of the proposed project is to replace an existing rubber dam on the Little Walla Walla River that has been damaged with a functional dam of the same type in the same location. For purposes of this consultation, instream flow diversions from the existing diversion dam will be evaluated as a part of the environmental baseline and future water withdrawals will be evaluated as cumulative effects, although any future withdrawals that require Federal action will be evaluated in a separate biological opinion. The administrative record for this consultation is on file at the Oregon Habitat Branch office.

1.1 Background and Consultation History

On June 12, 2003, NOAA Fisheries received a biological assessment (BA) from the BPA and a written request for concurrence with a finding that the project is "not likely to adversely affect" (NLAA) Middle Columbia River (MCR) steelhead (*Oncorhynchus mykiss*) in the project area. NOAA Fisheries sent the BPA a letter dated June 30, 2003, stating that based on information provided in the BA, the proposed project may affect, and is likely to adversely affect (LAA) MCR steelhead. In the June 30, 2003, letter, NOAA Fisheries requested additional information regarding the installation and maintenance of the rubber dam. This information was needed to evaluate the BPA's assessment of potential effects and to suggest modifications to the action to avoid potential adverse effects. NOAA Fisheries received the requested additional information for the Little Walla Walla Rubber Dam Replacement Project on July 7, 2003, and consultation was initiated at that time.

The Little Walla Walla River Rubber Dam Replacement Project would not likely affect tribal trust resources. Because the action would not affect tribal trust resources, no tribes would be affected and further tribal coordination is not necessary.

1.2 Proposed Action

Federal action is defined in the Services' consultation regulations (50 CFR 402.02) as "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas." Additionally, 16 U.S.C. 1855(b)(2) further defines a Federal action as "any action authorized, funded, or undertaken or proposed to be authorized, funded, or undertaken by a Federal agency." Because the BPA proposes to fund the use of public resources that may affect listed resources, it must consult under ESA section 7(a)(2) and MSA section 305(b)(2).

The BPA is proposing to fund the replacement of a rubber dam damaged by beavers and vandals on the Little Walla Walla River at River Mile (RM) 45.9 in Milton Freewater, Oregon. From March through November, the rubber dam is inflated and operates in conjunction with an Obermeyer Spillway Gate system next to the dam to create a pool of water that is diverted into a screened intake structure on the west bank of the river to provide irrigation water. A bypass pipe coming from the intake structure provides passage for fish and discharges them 40 feet downsteam from the diversion site. Any withdrawal of flows that would impair habitat conditions within the Little Walla Walla River is a habitat-modifying activity that may harm listed species and therefore be a "take" under ESA.[1] However, because instream flows would continue to be withdrawn from the existing facility whether or not the new rubber dam was installed, NOAA Fisheries does not consider take associated with such a withdrawal as incidental to the proposed action. Therefore, compliance with the terms and conditions found in section 2.6.3 of this Opinion will not remove the prohibition against take due to any instream flows withdrawn from the new rubber dam. NOAA Fisheries encourages the BPA to seek opportunities to implement the *Basinwide Salmon Recovery Strategy* (Federal Caucus 2000) by conserving flows in tributaries of the Walla Walla River Basin that are occupied MCR steelhead.

Before removing the existing dam, a cofferdam will be installed directly upstream of the rubber dam to dewater an area measuring a maximum of 2,000 square feet. The dewatered area will be the minimum size necessary to carry out activities associated with replacing the rubber dam. The site will be dewatered for approximately six weeks. The cofferdam will be installed using ecology blocks and/or sandbags. Before installing the cofferdam, as much water as possible will be diverted away from the rubber dam by dropping the gates to the Obermeyer Spillway and opening the intake structure and bypass pipe. Once the cofferdam is installed, electrical, submersible pumps will be used to dewater the enclosed area. The pumps will all have fish screens installed and be managed in accordance with NOAA Fisheries' fish screen criteria

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[1] See, 64 FR 60727 (November 8, 1999) (defining 'harm' as an element of 'take' in the ESA, citing removing water or otherwise altering streamflow when it significantly impairs spawning, migration, feeding or other essential behavioral patterns as an example), and 65 FR 42522 (July 10, 2000) (applying take prohibition to threatened species).

(NOAA Fisheries, June 10, 1996). The pumps will be powered by a generator that will be placed outside of the river influence area. The pumps will moil continuously until the area within the cofferdam has been dewatered and will continue to do so until the new rubber dam has been installed and tested.

Fisheries biologists from the Oregon Department of Fish and Wildlife (ODFW) and the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) will be on-site during the installation of the cofferdam and the subsequent dewatering of the enclosed area. ODFW and CTUIR biologists will electroshock and net fish trapped within the confines of the cofferdam. Fish that are captured will be transported in five gallon buckets approximately 25 meters upstream where they will be released. ODFW and CTUIR biologists estimate that as many as 1,000 fish could be captured during the salvage operations with less then a 5% chance of mortality associated with electroshocking procedures. The Obermeyer System and nearby fish ladder will allow all life stages of fish to pass around the proposed action area while the dam is being replaced.

An excavator, hoisting equipment, a small generator, an air compressor, a pressure washer, and hand tools will be used within the confines of the cofferdam to remove the existing rubber dam and install the new one. The excavator will travel along an existing gravel bar. All vehicles operated within 150 feet of any waterbody as a part of the proposed project will be diapered to prevent leaks and cleaned to remove all external grease, dirt, and mud before operations below bankfull elevation are implemented. Vehicles will be inspected daily for leaks before coming within 150 feet of any body of water. Any leaks that are found will be repaired before the vehicle in question leaves the staging area. Vehicle staging, cleaning, maintenance, refueling, and fuel storage will be done 150 feet or more from any body of water or wetland. A pollution and erosion control plan addressing equipment and material storage sites, fueling operations, staging areas, cement mortars and bonding agents, hazardous materials, spill containment and notification, and construction debris management will be developed before project implementation.

The existing dam is attached on either end to concrete abutments with anchor bolts. Nuts will be removed from the bolts by hand with a rachet wrench. Once the nuts are removed, the dam will be rolled up onto a steel drum. The dam will then be lifted and removed with the aid of crane. The dam will be moved to a location on site where it will be stored. It will then be the responsibility of the Hudson Bay Improvement District to dispose of the damaged rubber dam. The new dam will be hoisted by crane, rolled out, and attached to the existing abutments in the foundation with anchor bolts secured in place in the manner in which they were removed. Once in place, the rubber dam will be maintained and operated by the Hudson Bay Improvement District.

All work will be conducted between July 1 and October 31. It is anticipated that the project will begin on August 1, 2003, and cease by September 30, 2003. In the unlikely event of high flow conditions during the in-water work window, project operations will cease with the exception of efforts to minimize or avoid resource damage.

1.3 Description of the Action Area

An action area is defined by the Services' regulations (50 CFR Part 402) as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The action area for the proposed project starts at the dam site on the Little Walla Walla River at river mile 45.9 and extends approximately 150 feets downstream and upstream. The 5th field hydrologic unit code (HUC) encompassing the action area is the Umatilla River Basin. This area is used primarily for spawning and rearing by MCR steelhead.

2. ENDANGERED SPECIES ACT BIOLOGICAL OPINION

The objective of this Opinion is to determine whether the Little Walla Walla River Rubber Dam Replacement Project is likely to jeopardize the continued existence of the MCR steelhead.

2.1 Evaluating the Effects of the Proposed Action

In conducting analyses of habitat-altering actions under section 7 of the ESA, NOAA Fisheries uses the following steps of the consultation regulations and, when appropriate, combines them with The Habitat Approach (NOAA Fisheries 1999): (1) Consider the biological requirements and status of the listed species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species, and whether the action is consistent with any available recovery strategy; and (4) determine whether the species can be expected to survive with an adequate potential for recovery under the effects of the proposed or continuing action, the effects of the environmental baseline, and any cumulative effects, and considering measures for survival and recovery specific to other life stages. In completing this step of the analysis, NOAA Fisheries determines whether the action under consultation, together with all cumulative effects when added to the environmental baseline, is likely to jeopardize the ESA-listed species or adversely impact their habitat. If jeopardy or adverse modification are found, NOAA Fisheries may identify reasonable and prudent alternatives for the action that avoid jeopardy and/or destruction or adverse modification of listed species' habitat.

The fourth step above (jeopardy analysis) requires a two-part analysis. The first part focuses on the action area and defines the proposed action's effects in terms of the species' biological requirements in that area (*i.e.*, effects on essential features). The second part focuses on the species itself. It describes the action's effects on individual fish, populations, or both–and places that impact in the context of the ESU as a whole. Ultimately, the analysis seeks to determine whether the proposed action is likely to jeopardize a listed species' continued existence.

2.1.1 Biological Requirements

The first step NOAA Fisheries uses when applying ESA section 7(a)(2) to the listed ESUs considered in this Opinion includes defining the species' biological requirements within the action area. Biological requirements are population characteristics necessary for the listed ESUs to survive and recover to naturally-reproducing population sizes at which protection under the ESA would become unnecessary. The listed species' biological requirements may be described as characteristics of the habitat, population or both (McElhany *et al*. 2000).

In the 2003 status review update, NOAA Fisheries modified their previous approaches to ESU risk assessment to include Viable Species Population criteria (McElhany *et al*. 2000): abundance, growth rate/productivity, spatial structure, and diversity. The long-term population trends for MCR steelhead have remained negative, while the short-term population trends for the ESU have improved in comparison to the time frame analyzed in the last status review (NOAA Fisheries 2003). The median long-term population growth rate (Lambda, or λ) is 0.998 based upon the assumption that only natural origin spawners are returned from wild stock (NOAA Fisheries 2003). The short-term λ based on the same assumption is 1.013 (NOAA Fisheries 2003). Assuming that both hatchery and wild fish contribute to the natural production in proportion to their numbers the long-term λ is 0.733 and short-term λ is 0.753 (NOAA Fisheries 2003). The interim abundance target for MCR steelhead in the Walla Walla Basin is 2,600 (http://www.nwr.noaa.gov/ 1habcon/habweb/habguide/appendix_b.pdf) (Website Appendix A). In spite of the recent increases in numbers, the majority of populations in the ESU with abundance data are still below the interim abundance targets.

For actions that affect freshwater habitat, NOAA Fisheries may describe the habitat portion of a species' biological requirements in terms of a concept called properly functioning condition (PFC). PFC is defined as the sustained presence of natural[2] habitat-forming processes in a watershed that are necessary for the long-term survival of the species through the full range of environmental variation (NOAA Fisheries 1999). PFC, then, constitutes the habitat component of a species' biological requirements. Although NOAA Fisheries is not required to use a particular procedure to describe biological requirements, it typically considers the status of habitat variables in a matrix of pathways and indicators (MPI) (NOAA Fisheries 1996; Table 1) that were developed to describe PFC in forested montane watersheds. In the PFC framework, baseline environmental conditions are described as "properly functioning," "at risk," or "not properly functioning."

2.1.2 Status and Life History of MCR Steelhead

In this step, NOAA Fisheries also considers the current status of the listed species within the action area, taking into account population size, trends, distribution, and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list the species and also considers any new data that is relevant to the species' status. Please refer to website http://www.nwr.noaa.gov/1habcon/habweb/habguide/appendix_a_june2001.pdf (Website Appendix B) which includes a discussion of the general life history of the listed species.

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[2]The word "natural" in this definition is not intended to imply "pristine," nor does the best available science lead us to believe that only pristine wilderness will support salmon.

The BPA found that the Little Walla Walla River Rubber Dam Replacement Project is likely to adversely affect MCR steelhead. Based on the life histories of this ESU, the action agency determined that it is likely that juvenile life stages of these listed species would be adversely affected by the Little Walla Walla River Rubber Dam Replacement Project. The Middle Columbia River Steelhead ESU includes steelhead populations in Oregon and Washington drainages upstream of the Hood and Wind river systems to and including the Yakima River. Major drainages in this ESU are the Deschutes, John Day, Umatilla, Walla-Walla, Yakima, and Klickitat river systems. Almost all steelhead populations within this ESU, including those found in the Little Walla Walla River, are summer-run fish, the exceptions being winter-run components returning to the Klickitat and Fifteen Mile Creek watersheds. Summer-run steelhead are defined as those that enter fresh water in a sexually immature condition between May and October and require several months to mature and spawn. Winter steelhead enter fresh water between November and April with well developed gonads and spawn shortly thereafter.

Adult MCR steelhead enter the Columbia River after having spent an average of 1-2 years at sea. Beginning in the spring, they migrate upriver through the summer, fall, and winter, seeking their tributary of origin. By early the next spring the adults have reached their natal streams and spawn in gravel redds from March to early June. Steelhead are iteroparous, meaning that they have the ability to spawn multiple times, whereas all other species of *Oncorhynchus*, with the exception of cutthroat *(O. clarki),* spawn once and then die. Deposited eggs usually hatch by the July of the same year. The resulting juveniles will spend from one to four years rearing to smolt size at which time they will begin their migration to the ocean. The Little Walla Walla River is a tributary to the mainstem of the Walla Walla River which empties into the Columbia River just below the mouth of the Snake River. The Little Walla Walla River provides rearing and spawning habitat for MCR steelhead and juveniles are expected to be rearing in the project area during all phases of the proposed project.

2.1.3 Environmental Baseline in the Action Area

The environmental baseline is defined as: "The past and present impacts of all Federal, state, or private actions and other human activities in the action area, including the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation and the impacts of state and private actions that are contemporaneous with the consultation in progress" (50 CFR 402.02). In step 2, NOAA Fisheries evaluates the relevance of the environmental baseline in the action area to the species' current status. In describing the environmental baseline, NOAA Fisheries evaluates the listed Pacific salmon ESUs affected by the proposed action.

In general, the environment for listed species in the Columbia River Basin (CRB), including those that migrate past or spawn upstream from the action area, has been dramatically affected by the development and operation of the Federal Columbia River Power System (FCRPS). Storage dams have eliminated mainstem spawning and rearing habitat, and have altered the natural flow regime of the Snake and Columbia rivers, decreasing spring and summer flows, increasing fall and winter flow, and altering natural thermal patterns. Power operations cause fluctuation in flow levels and river elevations, affecting fish movement through reservoirs, disturbing riparian areas and possibly stranding fish in shallow areas as flows recede. The eight dams in the migration corridor of the Snake and Columbia rivers kill or injure a portion of the smolts passing through the area. The low velocity movement of water through the reservoirs behind the dams slows the smolts' journey to the ocean and enhances the survival of predatory fish (Independent Scientific Group 1996, National Research Council 1996). Formerly complex mainstem habitats in the Columbia, Snake, and Willamette Rivers have been reduced, for the most part, to single channels, with floodplains reduced in size, and off-channel habitats eliminated or disconnected from the main channel (Sedell and Froggatt 1984; Independent Scientific Group 1996; and Coutant 1999). The amount of large woody debris in these rivers has declined, reducing habitat complexity and altering the rivers' food webs (Maser and Sedell 1994).

Other human activities that have degraded aquatic habitats or affected native fish populations in the CRB include stream channelization, elimination of wetlands, construction of flood control dams and levees, construction of roads (many with impassable culverts), timber harvest, splash dams, mining, water withdrawals, unscreened water diversions, agriculture, livestock grazing, urbanization, outdoor recreation, fire exclusion/suppression, artificial fish propagation, fish harvest, and introduction of non-native species (Henjum *et al*. 1994; Rhodes *et al*. 1994; National Research Council 1996; Spence *et al*. 1996; and Lee *et al*. 1997). In many watersheds, land management and development activities have: (1) Reduced connectivity (*i.e.*, the flow of energy, organisms, and materials) between streams, riparian areas, floodplains, and uplands; (2) elevated fine sediment yields, degrading spawning and rearing habitat; (3) reduced large woody material that traps sediment, stabilizes streambanks, and helps form pools; (4) reduced vegetative canopy that minimizes solar heating of streams; (5) caused streams to become straighter, wider, and shallower, thereby reducing rearing habitat and increasing water temperature fluctuations; (6) altered peak flow volume and timing, leading to channel changes and potentially altering fish migration behavior; and (7) altered floodplain function, water tables and base flows (Henjum *et al*. 1994; McIntosh *et al*. 1994; Rhodes *et al.* 1994; Wissmar *et al.* 1994; National Research Council 1996; Spence *et al*. 1996; and Lee *et al*. 1997).

To address problems inhibiting salmonid recovery in CRB tributaries, the Federal resource and land management agencies developed the *Basinwide Salmon Recovery Strategy* (Federal Caucus 2000). Components of the *Basinwide Salmon Recovery Strategy* commit these agencies to increased coordination and a fast start on protecting and restoring salmonid habitats/populations.

The Walla Walla River Basin (WWRB) is located in southeast Washington and northeast Oregon and encompasses 1,758 square miles. The WWRB is characterized by moderate slopes and relatively level terrain with the exception of the portion of the basin that lies in the Blue Mountains. This section of the WWRB lies on steep, lightly timbered slopes within the Umatilla National Forest. The WWRB is bordered by the Snake River Basin to the north, the Tucannon and Grande Ronde Basins to the east, and the Umatilla basin to the south. The Walla Walla River, to which the Little Walla Walla River is a tributary, originates in the Blue Mountains at an elevation of 6,500 feet. The river flows out of the Blue Mountains and into valleys that drain onto low, relatively supine land. Approximately 90% of the land within the WWRB is privately owned. The remaining land belongs to federal (9%) and state (1%) entities. Agricultural production is the predominant land use within the WWRB accounting for 58% of the total land use.

In 1998, the American Rivers Organization listed the Walla Walla River as one of the nation's most endangered rivers. The primary anthropomorphic cause of the degraded state of both the Walla Walla and Little Walla Walla Rivers are the irrigation diversion structures similar to the rubber dam targeted for replacement as a part of the proposed project that have been installed throughout the WWRB to divert water for irrigation purposes. At the proposed action area, the rubber dam is inflated from early March through the end of December. Flows pool behind the rubber dam and are shunted through the diversion structure. During irrigation season, flows are approximately 100 cubic feet per second (cfs) immediately upstream of the diversion and 25 cfs past the point of diversion. This translates into the removal of approximately 75% of the instream flow in the Little Walla Walla River for ten months of each year.

Barriers such as the rubber dam exert numerous impacts on the river system that have the potential to negatively impact listed fish. Water temperatures both above and below the dam may be altered as flows are depleted. Water temperatures may reach sublethal or lethal levels when instream flows are depleted during irrigation season. Seasonal flows may be altered as natural flood events are eliminated or minimized. Excessive amounts of silt may accumulate above the dam. Increased sedimentation may result in minor siltation of downstream spawning gravels. During periods of high flow, structures such as the inflatable dam may not be a barrier to fish passage but may become one during times when instream flows are low. Even in instances where fish passage is provided around barriers by way of a fish ladder or other similar structure, fish movement may be delayed or impeded.

Fish habitat along the Little Walla Walla River is negatively impacted by non-point contaminant sources such as urban storm water runoff from the town of Milton-Freewater and agricultural wastes (USACE, 1997). Substances such as oil, paint, and herbicides are often found in storm water and taint bodies of water such as the Little Walla Walla River used by listed fish species. Soil particles containing fertilizers and other chemical byproducts are frequently washed from land used for agricultural purposes into the river during high flow events. Nitrogen rich fertilizers increase eutrophication and deplete dissolved oxygen levels in bodies of water. Ironically, the effect of these contaminants is exacerbated by the levees and dyke systems found along the banks of the Little Walla Walla River; structures that were originally built to protect the river system.

Construction of dikes and levees, rip-rapping, and the channelization of the Little Walla Walla River have contributed to the degradation of aquatic habit essential to the survival of MCR steelhead. These structures have altered the natural flow of the river by confining the flood plain, channelizing the river, and catalyzing a state of geomorphic disequilibrium in the stream system. The amount and quality of sediment that the Little Walla Walla River is able to transport has been negatively affected by the changes in sinuosity, gradient, and channel geometry imposed by the aforementioned levees and dykes. Effects of sedimentation on fish habitat include: (1) A reduction in the amount and quality of pool habitat; (2) higher degree of cobble emebeddedness resulting in lower stream productivity and a consequent decrease in the reproductive success of listed fish species; and (3) increased bank erosion and a subsequent encroachment on riparian vegetation due to forced lateral channel adjustment. (USACE 1997)

The biological requirements of the listed species are not being met under the environmental baseline. Conditions in the action area would have to improve, and any further degradation of the baseline, or delay in improvement of these conditions would probably further decrease the likelihood of survival and recovery of the listed species under the environmental baseline. The combined effects of chemical contaminants, diversion structures, and water withdrawals have left the Little Walla Walla River in a highly degraded state.

Pacific salmon populations also are substantially affected by variation in the freshwater and marine environments. Ocean conditions are a key factor in the productivity of Pacific salmon populations. Stochastic events in freshwater (flooding, drought, snowpack conditions, volcanic eruptions, *etc.*) can play an important role in a species' survival and recovery, but those effects tend to be localized compared to the effects associated with the ocean. The survival and recovery of these species depends on their ability to persist through periods of low natural survival due to ocean conditions, climatic conditions, and other conditions outside the action area. Freshwater survival is particularly important during these periods because enough smolts must be produced so that a sufficient number of adults can survive to complete their oceanic migration, return to spawn, and perpetuate the species. Therefore it is important to maintain or restore the PFC of the Little Walla Walla River in order to sustain the ESU through these periods. Additional details about the importance of freshwater survival to Pacific salmon populations can be found in Federal Caucus (2000), NOAA Fisheries (2000), and Oregon Progress Board (2000).

2.2 Analysis of Effects

Effects of the action are defined as: "The direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with the action, that will be added to the environmental baseline" (50 CFR 402.02). Direct effects occur at the project site and may extend upstream or downstream based on the potential for impairing the value of habitat for meeting the species' biological requirements. Indirect effects are defined in 50 CFR 402.02 as "those that are caused by the proposed action and are later in time, but still are reasonably certain to occur." They include the effects on listed species or critical habitat of future activities that are induced by the proposed action and that occur after the action is completed. "Interrelated actions are those that are part of a larger action and depend on the larger action for their justification" (50 CFR 403.02). "Interdependent actions are those that have no independent utility apart from the action under consideration" (50 CFR 402.02).

In step 3 of the jeopardy analysis, NOAA Fisheries evaluates the effects of proposed actions on listed species and seeks to answer the question of whether the species can be expected to survive with an adequate potential for recovery.

2.2.1 Habitat Effects

NOAA Fisheries will consider any scientifically credible analytical framework for determining an activity's effect. To streamline the consultation process and to lead to more consistent effects determinations across agencies, NOAA Fisheries, where appropriate, recommends that action agencies use the MPI and procedures in NOAA Fisheries (1996), particularly when their proposed action would take place in forested montane environments. The MPI was used to assess the current condition of various steelhead habitat parameters. Use of the MPI identified the following habitat indicators as either at risk or not properly functioning within the action area: Temperature, sediment, large woody debris, pool frequency, pool quality, off channel habitat, floodplain connectivity, peak/base flows, road density and location, disturbance history, and riparian reserves. Substrate, width/depth ratio, and streambank condition were all identified as properly functioning. Actions that do not maintain or restore properly functioning aquatic habitat conditions have the potential to jeopardize the continued existence of MCR steelhead.

For the streams typically considered in salmon habitat-related consultations, a watershed is a logical unit for analysis of potential effects of an action (particularly for actions that are large in scope or scale). Healthy salmonid populations use habitats throughout watersheds (Naiman *et al.* 1992), and riverine conditions reflect biological, geological and hydrological processes operating at the watershed level (Nehlsen *et al*. 1997; Bisson *et al.* 1997; and NOAA Fisheries 1999). Although NOAA Fisheries prefers watershed-scale consultations due to greater efficiency in reviewing multiple actions, increased analytic ability, and the potential for more flexibility in management practices, often it must analyze effects at geographic areas smaller than a watershed or basin due to a proposed action's scope or geographic scale. Analyses that are focused at the scale of the site or stream reach may not be able to discern whether the effects of the proposed action will contribute to or be compounded by the aggregate of watershed impacts. This loss of analytic ability typically should be offset by more risk averse proposed actions and ESA analysis in order to achieve parity of risk with the watershed approach (NOAA Fisheries 1999).

The Little Walla Walla River Rubber Dam Replacement Project BA provides an analysis of the effects of the proposed action on MCR steelhead in the action area. The analysis uses the MPI and procedures in NOAA Fisheries' (1996), the information in the BA, and the best scientific and commercial data available to evaluate elements of the proposed action that have the potential to affect the listed fish.

In the short term, the activities associated with the proposed project have the potential to directly harm juvenile fish or disturb rearing juveniles. Disturbance of riparian and instream habitat is expected, and a temporary increase of sediment and turbidity is unavoidable. Suspended sediment and turbidity influences on fish reported in the literature range from beneficial to detrimental. Elevated total suspended solids (TSS) conditions have been reported to enhance cover conditions, reduce piscivorus fish/bird predation rates, and improve survival. Elevated TSS conditions have also been reported to cause physiological stress, reduce growth, and adversely affect survival. Of key importance in considering the detrimental effects of TSS on fish are the frequency and the duration of the exposure, not just the TSS concentration.

Behavioral avoidance of turbid waters may be one of the most important effects of suspended sediments (DeVore *et al.* 1980, Birtwell *et al.* 1984, Scannell 1988). Salmonids have been observed to move laterally and downstream to avoid turbid plumes (McLeay *et al.* 1984, 1987, Sigler *et al.* 1984, Lloyd 1987, Scannell 1988, Servizi and Martens 1991). Juvenile salmonids tend to avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, unless the fish need to traverse these streams along migration routes (Lloyd *et al.* 1987). In addition, a potentially positive reported effect is providing refuge and cover from predation (Gregory and Levings 1988).

Fish that remain in turbid, or elevated TSS, waters experience a reduction in predation from piscivorus fish and birds (Gregory and Levings 1998). In systems with intense predation pressure, this provides a beneficial trade off (*e.g.*, enhanced survival) to the cost of potential physical effects (*e.g.*, reduced growth). Turbidity levels of about 23 Nephalometric Turbidity Units (NTU) have been found to minimize bird and fish predation risks (Gregory 1993). Exposure duration is a critical determinant of the occurrence and importance of physical or behavioral effects (Newcombe and MacDonald 1991). Salmonids have evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with flood events, and are adapted to such high pulse exposures. Adult and larger juvenile salmonids may be little affected by the high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes (Bjornn and Reiser 1991). However, research shows that chronic exposure can cause physiological stress responses that can increase maintenance energy and reduce feeding and growth (Redding *et al.* 1987, Lloyd 1987, Servizi and Martens 1991).

Turbidity, at moderate levels, has the potential to adversely affect primary and secondary productivity, and at high levels, has the potential to injure and kill adult and juvenile fish, and may also interfere with feeding (Spence *et al.* 1996). Newly emerged salmonid fry may be vulnerable to even moderate amounts of turbidity (Bjornn and Reiser 1991). Other behavioral effects on fish, such as gill flaring and feeding changes, have been observed in response to pulses of suspended sediment (Berg and Northcote 1985). Fine redeposited sediments also have the potential to adversely affect primary and secondary productivity (Spence *et al.* 1996), and to reduce incubation success (Bell 1991) and cover for juvenile salmonids (Bjornn and Reiser 1991). These effects are expected to be minimal due to the use of sediment control measures such as silt fences and straw bales and completing all instream construction activities during periods of low flow (July and August).

Increased sedimentation may also lead to increased embeddness of spawning substrates downstream of the project. Instream work scheduled for these projects will take place during the

ODFW in-water window for the area. Due to the typically low flows present in the individual project areas during this time, sedimentation rates are expected to be minimal. Disturbance of riparian vegetation could result from operation of heavy machinery near the stream and could lead to decreased shade, increased water temperatures, and decreased streambank stability until riparian vegetation is re-established.

Fuel or other contaminant spills associated with use of heavy equipment in or near the stream may also occur. As with all construction activities, accidental release of fuel, oil, and other contaminants may occur. Operation of back-hoes, excavators, and other equipment requires the use of fuel, lubricants, etc., which, if spilled into the channel of a water body or into the adjacent riparian zone, can injure or kill aquatic organisms. Petroleum-based contaminants (such as fuel, oil, and some hydraulic fluids) contain poly-cyclic aromatic hydrocarbons (PAHs), which can be acutely toxic to salmonids at high levels of exposure and can also cause chronic lethal and acute and chronic sublethal effects to aquatic organisms (Neff 1985). The timing of the work, the limited use of equipment in the stream channel, and the small size of the disturbed area will all serve to minimize the magnitude of the short-term effects. The effects of these activities on MCR steelhead will be minimized by implementing construction methods and approaches (that are included in project design) intended to avoid or minimize impacts.

Due to the short-term nature of actions associated with the proposed project, NOAA Fisheries does not anticipate any long-term changes to the existing baseline conditions. Consequently, NOAA Fisheries does not expect that the effects of the actions associated with the project will diminish the long-term value of the habitat for the survival of MCR steelhead.

2.2.2 Species Effects

The ODFW/CTUIR plan to conduct electrofishing/seining/dip netting as necessary to capture and relocate stranded fish trapped in the area directly above the rubber dam which will be dewatered during project implementation. Juvenile salmonids may be injured or killed as a result of activities associated with electrofishing, netting, handling, and transporting.

Handling, Holding, and Hauling

The amount of time spent handling live fish should be kept to an absolute minimum. Studies have shown that all aspects of handling such as dipnetting and time out of the water are highly stressful (Merrick 1990; Thomas and Robertson 1991) to fish and can lead to immediate or delayed mortality (Piper *et al.* 1982; Stickney and Kohler 1990). The mucous coating on a fishes' skin coupled with their propensity to flounder wildly when taken out of the water makes them exceptionally difficult to handle. Handlers may inadvertently drop or crush fish when holding and/or hauling them.

Though a large number of techniques have been developed to minimize stress when hauling fish, numerous studies have shown that doing so causes distress to fish both physically and psychologically. Low dissolved oxygen levels and prolonged exposure to high water temperatures, diseases, viruses, fungi and intense light can culminate in shock which could ultimately lead to death.

Electrofishing

A fishes' response to electrofishing is dictated by the nature and intensity of the wave form applied as a part of the electrical field. Fish responses to electrofishing may include: (1) Alteration of behavior or reactive movements; (2) trauma resulting from stress; and (3) injury in the form of tissue damage. Trauma in any of these forms may lead to death.

Electrofishing-induced injuries often go unnoticed because injured fish may appear normal upon release. Stress-induced conditions such as acidosis and reduced respiratory efficiency take hours or even days to recover from. Bruising, commonly referred to as banding, is a common side effect of electroshocking. Bruising occurs when capillaries under the skin hemorrhage. Healing takes a significant amount of time and bruised tissue is susceptible to bacterial and fungal infections. During recovery, affected fish are vulnerable to predation and are unable to compete with other fish species for food due to their weakened state. (Schreck *et al.* 1976). Measures outlined in the Terms and Conditions Section and Appendix A of this Opinion will help ensure potential adverse effects associated with electroshocking are minimized.

The effect that a proposed action has on MPI pathways can be translated into a likely effect on population growth rate. In the case of this consultation it is not possible to quantify an incremental change in survival for MCR steelhead. While population growth rates have been calculated at the large ESU scale, changes to the environmental baseline from the proposed action were described only within the action area (typically a watershed). An action that improves habitat in a watershed, and thus helps meet essential habitat feature requirements, may therefore increase lambda for the portion of the ESU in the action area.

Based on the effects described above, the Little Walla Walla Rubber Dam Replacement Project will have a neutral effect on the survival and recovery of MCR steelhead.

2.2.3 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." These activities within the action area also have the potential to adversely affect the listed species. Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities, are being reviewed through separate section 7 consultation processes. Federal actions that have already undergone section 7 consultation have been added to the description of the environmental baseline in the action area.

State, Tribal, and local government actions will likely be in the form of legislation, administrative rules, or policy initiatives. Government and private actions may encompass changes in land and water uses–including ownership and intensity–any of which could adversely affect listed species or their habitat. Government actions are subject to political, legislative, and fiscal uncertainties.

Changes in the economy have occurred in the last 15 years, and are likely to continue, with less large-scale resource extraction, more targeted extraction, and significant growth in other economic sectors. Growth in new businesses, primarily in the technology sector, is creating urbanization pressures and increased demands for buildable land, electricity, water supplies, waste-disposal sites, and other infrastructure.

Economic diversification has contributed to population growth and movement, and this trend is likely to continue. Such population trends will result in greater overall and localized demands for electricity, water, and buildable land in the action area; will affect water quality directly and indirectly; and will increase the need for transportation, communication, and other infrastructure. The impacts associated with these economic and population demands will probably affect habitat features such as water quality and quantity, which are important to the survival and recovery of the listed species. The overall effect will likely be negative, unless carefully planned for and mitigated.

The withdrawal of water for irrigation purposes along the Little Walla Walla River is reasonably certain to occur far into the future. Farming has played a major role in the economies of communities throughout the WWRB since the early 1800's. Farmers rely upon the water they procure from the Little Walla Walla River through diversions, such as the one associated with the rubber dam in the proposed action area, to sustain crops ranging from wheat and alfalfa to fruit. Very few diversions are metered and water rights are severely over allocated. Farmers and ranchers are hesitant to give up their water rights because any water that is left in the river will be consumed by irrigators further downstream (Watermaster Bill Neve, 1998 personal communication). Though many farmers and ranchers have taken measures to increase water use efficiency on their land with the aid of techniques such as drip irrigation, portions of the Little Walla Walla River are essentially dry during certain periods of the year. Adverse impacts to fish resulting from the over allocation of water rights and subsequent diversion of flows from the Little Walla Walla River include increased water temperatures, low instream flows, high levels of sediment and pollution, potential stranding of fish, and the fragmentation of aquatic habitat.

Non-federal activities within the action area are expected to increase with a projected 34 percent increase in human population over the next 25 years in Oregon (Oregon Department of Administrative Services 1999). Thus, NOAA Fisheries assumes that future private and State actions will continue within the action area, but at increasingly higher levels as population density climbs. Most future actions by the state of Oregon are described in the Oregon Plan for Salmon and Watershed measures, which includes a variety of programs designed to benefit salmon and watershed health.

2.2.4 Consistency with Listed Species ESA Recovery Strategies

Recovery is defined by NOAA Fisheries regulations (50 CFR 402) as an "improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in section 4 (a)(1) of the Act." Recovery planning is underway for listed Pacific salmon in the Northwest with technical recovery teams identified for each domain. Recovery planning will help identify measures to conserve listed species and increase the survival of each life stage. NOAA Fisheries also intends that recovery planning identify the areas/stocks most critical to species conservation and recovery, and thereby evaluate proposed actions on the basis of their effects on those areas/stocks.

Until the species-specific recovery plans are developed, the FCRPS Opinion and the *Basinwide Salmon Recovery Strategy* (Federal Caucus 2000) provide the best guidance for judging the significance of an individual action relative to the species-level biological requirements. In the absence of completed recovery plans, NOAA Fisheries strives to ascribe the appropriate significance to actions to the extent available information allows. Where information is not available on the recovery needs of the species, either through recovery planning or otherwise, NOAA Fisheries applies a conservative substitute.

The BPA has specific commitments to uphold under the Basinwide Salmon Recovery Strategy. For Federal lands, PACFISH[3] and land management plans define these commitments. Due to the limited scope of the Little Walla Walla River Rubber Dam Replacement Project, the proposed action does not further primary objectives of the Basinwide Salmon Recovery Strategy.

2.3 Conclusion

NOAA Fisheries has determined that, when the effects of the subject actions addressed in this Opinion are added to the environmental baseline and cumulative effects occurring in the action area, they are not likely to jeopardize the continued existence of MCR steelhead. NOAA Fisheries believes that the proposed action will cause some minor short-term increases in stream turbidity and sedimentation rates in the Little Walla Walla River. Due to the limited scope, magnitude, and duration of the proposed action, it is not expected that the Little Walla Walla River Rubber Dam Replacement Project will impair properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward proper functioning condition which is essential to the long-term survival and recovery at the population or ESU level.

[3]NOAA Fisheries. 1995. Biological opinion for implementation of interim strategies for managing anadromous fish-producing areas in eastern Oregon and Washington, Idaho, and portions of California (PACFISH).

2.4 Conservation Recommendations

Conservation recommendations are defined as "discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information" (50 CFR 402.02). Section 7 (a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. NOAA Fisheries believes the following conservation recommendations are consistent with these obligations and therefore should be carried out by the BPA.

1. The BPA should advise the project applicants that compliance with terms and conditions issued in the incidental take statement issued with this Opinion do not remove the prohibition against take that may result from water withdrawals from the replaced rubber diversion dam.

2. Pursuant to Basinwide Salmon Recovery Strategy (Federal Caucus 2000), the BPA should continue to pursue actions in the Walla Walla River Basin that will help stabilize MCR steelhead populations and achieve immediate improvements in survival across all life stages, such as removing passage barriers, screening diversions, purchasing in-stream flow rights, restoring water quality and acquiring high-quality habitat. continue to pursue opportunities to conserve/enhance instream flows in the Walla Walla Basin.

2.5 Reinitiation of Consultation

As provided in 50 CFR 402.16, reinitiation of formal consultation is required if: (1) The amount or extent of taking specified in the incidental take statement is exceeded, or is expected to be exceeded; (2) new information reveals effects of the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease, pending conclusion of the reinitiated consultation.

2.6 Incidental Take Statement

The ESA at section 9 [16 USC 1538] prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonids by section 4(d) rule [50 CFR 223.203]. Take is defined by the statute as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." [16 USC 1532(19)] Harm is defined by regulation as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering." [50 CFR 222.102] Harass is defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering." [50 CFR 17.3] Incidental take is defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant." [50 CFR 402.02] The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement [16 USC 1536].

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

2.6.1 Amount or Extent of Take

NOAA Fisheries anticipates that the Little Walla Walla River rubber dam replacement project is reasonably certain to cause incidental take of MCR steelhead through habitat-related harm, and through injury or death of individual MCR steelhead salvaged during isolation of the in-water work area. Take associated with this type of habitat-related harm cannot be expressed as a quantity. Therefore, although NOAA Fisheries expects this action to cause some low level of harm, the best scientific and commercial data available are not sufficient to enable NOAA Fisheries to quantify the harm. In instances such as these, NOAA Fisheries designates the harm as the adverse habitat effects of the proposed action after application of the proposed conservation measures, and considers this level of take as "unquantifiable." Further, NOAA Fisheries estimates amount of injury or death associated with isolation of the in-water work area by assuming that up to 1,000 MCR steelhead may be captured during salvage operations and 50 may die during handling. If the proposed action results in death of more than 50 juvenile MCR steelhead, the BPA needs to reinitiate this consultation. Incidental take associated with this project is not expected to be measurable as a long-term effect on MCR steelhead populations. The exemption from the prohibition against take provided by this incidental take statement applies only to incidental take that occurs within the action area.

2.6.2 Reasonable and Prudent Measures

Reasonable and prudent measures are non-discretionary measures to minimize take, that may or may not already be part of the description of the proposed action. They must be implemented as binding conditions for the exemption in section 7(o)(2) to apply. The BPA has the continuing duty to regulate the activities covered in this incidental take statement. If the BPA fails to require the applicants to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. NOAA Fisheries believes that activities carried out in a manner consistent with these reasonable and prudent measures, except those otherwise identified, will not necessitate further site-specific consultation. Activities which do not comply with all relevant reasonable and prudent measures will require further consultation.

NOAA Fisheries believes that the following reasonable and prudent measures are necessary and appropriate to minimize take of listed fish resulting from implementation of the action.

The BPA shall:

1. Minimize the amount and extent of incidental take from in-water construction activities by taking measures to limit the duration and extent of in-water work, and by timing such work when the impacts to MCR steelhead are minimized.

2. Minimize the amount and extent of incidental take from construction activities in or near the creeks by developing and implementing effective erosion and pollution control measures throughout the area of disturbance. The measures shall minimize the movement of soils and sediment both into and within the river, and will stabilize bare soil over both the short term and long term.

3. Minimize the likelihood of incidental take that may occur during the fish salvage (trap and haul) operations.

4. Ensure effectiveness of implementation of the reasonable and prudent measures by monitoring erosion control measures and planting for site restoration both during and following construction.

2.6.3 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the action must be implemented in compliance with the following terms and conditions, which implement the reasonable and prudent measures described above for each category of activity. These terms and conditions are non-discretionary.

1. To implement reasonable and prudent measure #1 (in-water work), the BPA shall ensure that:

    a. <u>Project Design</u>. The following overall design conditions are met:

        i. <u>Minimum area</u>. Construction impacts will be confined to the minimum area necessary to complete the project. As much work as possible proposed for below the ordinary high water line will be completed during low flow periods and in the dry.

        ii. <u>In-water work</u>. All work within the active channel will be completed within the ODFW approved in-water work period for this area, July1 through October 31. Extensions of the in-water work period, including those for work outside the wetted perimeter or the stream but below the ordinary high water mark, must be approved by biologists from NOAA Fisheries. Project operations will cease under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.

iii. Measures will be taken to protect localized populations of listed fish species. Passage will be provided for any adult or juvenile salmonid species present in the project area during construction, and after construction for the life of the project. A fisheries biologist will monitor the project site by snorkeling and visual observation immediately prior (no more then 48 hours) to commencement of instream work to determine if sensitive salmonid species are present in the immediate construction areas. In the event that fish are present, in-water activities will cease until an ODFW and/or CTUIR fisheries biologist is contacted and appropriate measures taken to ensure that appropriate protection measures are implemented before in-water work proceeds.

iv. CTUIR, ODFW, and BPA personnel will provide continuous construction inspection during implementation of the project.

v. Monitoring for spawning activity in the action area will be conducted throughout the time period adult fish may be present. If spawning activity occurs, instream work will stop until a CTUIR and/or ODFW fisheries biologist is contacted and appropriate measures defined and executed to ensure that spawning fish are not adversely affected by activities associated with the project in any way.

2. To implement reasonable and prudent measure #2 (erosion and pollution control measures), the BPA shall ensure that:

a. Isolation of in-water work area. The work area will be well isolated from the active flowing stream to minimize the potential for sediment entrainment. Sediment levels will be monitored to ensure compliance with state water quality standards. All project operations, except efforts to minimize sedimentation, will cease if sediment levels exceed state water quality standards.

b. Pollution and erosion control plan. A Pollution and Erosion Control Plan (PECP) will be developed to prevent point-source pollution related to construction operations. The PECP will contain the pertinent elements listed below and meet requirements of all applicable laws and regulations:

i. Methods that will be used to prevent erosion and sedimentation associated with access roads, stream crossings, construction sites, equipment and material storage sites, fueling operations and staging areas.

ii. Methods that will be used to confine and remove and dispose of excess concrete, cement, and other mortars or bonding agents, including measures for washout facilities.

iii. A description of the hazardous products or materials that will be used, including inventory, storage, handling, and monitoring.

iv. A spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures that will be available on site, proposed methods for disposal of spilled materials, and employee training for spill containment.

v. Measures that will be taken to prevent construction debris from falling into any aquatic habitat. Any material that falls into a stream during construction operations will be removed in a manner that has a minimum impact on the streambed and water quality.

vi. Equipment that is used for work shall be cleaned prior to entering the job site. External oil and grease shall be removed, along with dirt and mud. Untreated wash and rinse water will not be discharged into construction area without adequate treatment. Areas for fuel storage and servicing of construction equipment and vehicles will be located at least 300 feet away from any body of water.

vii. The contractor shall develop and implement a site-specific spill prevention, containment, and control plan (SPCCP) that includes notification procedures, and is responsible for containment and removal of any toxins released. The contractor will be monitored by the BPA to ensure compliance with the SPCCP.

viii. The person identified as the Erosion and Pollutant Control Manager (EPCM) shall also be responsible for the management of the contractors' SPCCP. In the event of a hazardous materials or petrochemicals spill, the EPCM shall be responsible for:

(1) Taking immediate action to recover toxic materials from further impacting aquatic or riparian resources

(2) Documenting a detailed description of the quantity, type, source, reason for the spill, and actions taken to recover materials.

(3) Notifying necessary state officials if a spill does occur.

(4) Ensuring that all refueling of equipment will take place 300 feet from any body of water and auxiliary fuel tanks will not be stored on bridges, roads or within the two-year flood plain.

3. To implement reasonable and prudent measure #3 (trap and haul), the BPA shall ensure that:

a. The fish salvage operation is conducted by qualified personnel familiar with and implementing NOAA Fisheries electrofishing or seining guidelines (Appendix A).

b. During electroshocking or seining, backpack electroshockers and other necessary equipment that meet NOAA Fisheries guidelines for use on ESA-listed fish will be used. The number of passes through the stretch will be kept to a minimum.

c. No seining or electrofishing shall be conducted when water temperatures exceed 18˚ C. During periods of high water temperature, sampling shall occur early in the morning or in the evening before dark.

d. Surveyors shall observe the condition of sampled fish. If fish appear stressed or injured (dark bands, gulping air, excessive mucus, irregular swimming, or bucket predation), immediately halt sampling and decrease the frequency and voltage.
e. There shall be no fin clipping or use of anaesthetics on ESA listed salmonids.
f. Fish will be transported in aerated buckets or tanks to a safe, upstream area as soon as possible.

4. To implement reasonable and prudent measures #4 (monitoring), the BPA shall ensure that:

   a. Within one year of completing the project, the BPA will submit a monitoring report to NOAA Fisheries describing the BPA's success in meeting these terms and conditions.
   b. This report will consist of the following information:
      i. Project name;
      ii. Starting and ending dates of work completed for this project;
      iii. The name and address of the construction supervisor;
      iv. A narrative assessment of the project's effects on natural stream function;
      v. Photographic documentation of environmental conditions at the project site before, during and after project completion;
      vi. A summary of summer stream temperatures for the project area recorded by thermographs; and
      vii. A summary of a monitoring and maintenance activities carried out by the BPA and contractor.
   c. If a dead, injured, or sick endangered or threatened species specimen is located, initial notification must be made to the National Marine Fisheries Service Law Enforcement Office, located at Vancouver Field Office, 600 Maritime, Suite 130, Vancouver, Washington 98661; telephone: 360.418.4246. Care should be taken in handling sick or injured specimens to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered and threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.
   d. Monitoring reports will be submitted to:

NOAA Fisheries
Oregon Habitat Branch
Attn: **2003/00747**
525 NE Oregon Street, Suite 500
Portland, OR 97232-2778

To ensure that these terms and conditions are met, BPA personnel will be on-site for all construction and monitoring activities.

All terms and conditions shall be included in any permit, grant, or contract issued for the implementation of the action described in this Opinion.

3. MAGNUSON-STEVENS ACT

3.1 Statutory Requirements

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan.

Pursuant to the MSA:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2)).

- NOAA Fisheries must provide conservation recommendations for any Federal or State action that may adversely affect EFH (§305(b)(4)(A));

- Federal agencies must provide a detailed response in writing to NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NOAA Fisheries EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

EFH consultation with NOAA Fisheries is required for any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action may adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects on EFH.

3.2 Identification of EFH

Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of federally-managed Pacific salmon: chinook; coho; and Puget Sound pink salmon (*O. gorbuscha*)(PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the *Pacific Coast Salmon Plan* (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based, in part, on this information.

3.3 Proposed Actions

The proposed action and action area are detailed above in Sections 1.2 and 1.3 of this document. The action area includes habitats that have been designated as EFH for various life-history stages of chinook and coho salmon.

3.4 Effects of Proposed Action on EFH

The effects on chinook and coho salmon are the same as those for MCR steelhead and are described in detail in section 2.2.1 of this document, the proposed action may result in short- and long-term adverse effects on a variety of habitat parameters. These adverse effects are:

- Disturbance of instream habitat is expected, and a temporary increase of sediment and turbidity resulting from construction activities is unavoidable.
- Riparian vegetation may be damaged or destroyed during construction.
- Large machinery working near stream habitats may compact gravel and other types of substrate.

3.5 Conclusion

NOAA Fisheries concludes that the proposed action may adversely affect designated EFH for chinook and coho salmon.

3.6 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. The conservation measures proposed for the project by the BPA, all of the Rreasonable and prudent measures and the terms and conditions contained in sections 2.2 and 2.3, respectively, are applicable to salmon EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH conservation recommendations.

3.7 Statutory Response Requirement

Pursuant to the MSA (§305(b)(4)(B)) and 50 CFR 600.920(j), Federal agencies are required to provide a detailed written response to NOAA Fisheries' EFH conservation recommendations within 30 days of receipt of these recommendations. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. In the case of a response that is inconsistent with the EFH conservation recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

3.8 Supplemental Consultation

The BPA must reinitiate EFH consultation with NOAA Fisheries if the proposed action is substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920(l)).

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Appendix A. NOAA Fisheries' Electrofishing Guidelines (NOAA 2000)

ELECTROFISHING GUIDELINES

Suggested protocol for the use of backpack electrofishing equipment in waters containing fish listed under the Endangered Species Act (ESA). These recommendations should be seen as guidelines for developing consistent and safe electrofishingtechnique. It is hoped that these guidelines will ultimately help improve electrofishing technique in ways which will reduce fish injury and increase electrofishing efficiency.

Purpose and Scope

The purpose of this document is to recommend guidelines for using backpack electrofishing equipment to sample ESA-listed fish. Because electrofishing can kill or severely injure fish, every effort should be made to avoid electrofishing and use snorkeling or other fishery information collection techniques. Where electrofishing is the only suitable sampling method, these guidelines are suggested to help reduce the number of fish killed or severely injured. These guidelines are concerned only with studies that involve electrofishing juvenile or adult salmonids that are *not* in spawning condition. Electrofishing in the vicinity of adults in spawning condition or operating equipment in the vicinity of redds containing developing eggs is not discussed as there is no justifiable basis for permitting these activities near listed species. Also, these guidelines do not deal with factors such as temperature or fish handling technique both of which can significantly affect fish health during an electrofishing session. Nonetheless, all ESA-listed fish must be sampled with extreme care. The field crew must carefully design the sampling sessions to minimize fish stress by working within favorable temperature regimes, using anesthetics when necessary, and minimizing the time the fish are held before release. As with all fieldwork involving live ESA-listed fish, the best science should be used along with an experienced crew and good equipment in order to minimize handling stress.

Equipment

Equipment should be in good working condition. Operators should go through the manufacturer's preseason checks, adhere to all provisions, and record major maintenance work in a log.

Training

A crew leader having at least 100 hours of electrofishing experience in the field using similar equipment should train the crew. The crew leader's experience must be documented and available for confirmation; such documentation may be in the form of a logbook. The training should occur before an inexperienced crew begins any electrofishing; it should also be conducted in waters that do not contain ESA-listed fish.

The training program must include the following elements:

1. Definitions of basic terminology: *e.g.* galvanotaxis, narcosis, and tetany.

2. An explanation of how electrofishing attracts fish.

3. An explanation of how gear can injure fish and how to recognize signs of injury.

4. A review of these guidelines and the manufacturer's recommendations.

5. A demonstration of the proper use of electrofishing equipment, the role each crew member performs, and basic gear maintenance.

6. A field session where new individuals actually perform each role on the electrofishing crew.

Specific Electrofishing Guidelines

1. In order to avoid contact with spawning adults or active redds, carefully survey the area to be sampled before beginning electrofishing.

2. Measure conductivity and set voltage as follows:

Conductivity (umhos/cm)	Voltage
Less than 100	900 to 1100
100 to 300	500 to 800
Greater than 300	150 to 400

3. Only direct current (DC) should be used.

4. Each session should begin with pulse width and rate set to the minimum needed to capture fish. These settings should be gradually increased only to the point where fish are immobilized and captured. Start with pulse width of 500 us and do not exceed 5 milliseconds. Pulse rate should start at 30Hz and work carefully upwards. *In general*, exceeding 40 Hz will injure more fish.

5. The zone of potential fish injury is 0.5m from the anode. Care should be taken in shallow waters, undercut banks, or where fish can be concentrated because in such areas the fish are more likely to come into close contact with the anode.

6. The stream segment should be worked systematically, moving the anode continuously in a herringbone pattern through the water. Do not electrofish one area for an extended period.

7. Crew should carefully observe the condition of the sampled fish. Dark bands on the body and longer recovery times are signs of injury or handling stress. When such signs are noted, the settings for the electrofishing unit may need adjusting. Sampling should be terminated if injuries occur or abnormally long recovery times persist.

8. When the sampling design involves taking scales and measurements, a healthy environment for the stressed fish must be provided and the holding time must be minimized. For these operations, additional crew members who are experienced in holding and processing stressed fish may be necessary.

9. Whenever possible, a block net should be placed below the area being sampled to capture stunned fish that may drift downstream.

10. The electrofishing settings should be recorded in a logbook along with conductivity, temperature, and other variables affecting efficiency. These notes, together with observations on fish condition, will improve technique and form the basis for training new operators.